

Asia Techno Farm Initiative

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Abstract

The author proposed the Asia Rice Project in 2014 showing the concept how ASEAN Economic Community should be united to achieve the final goal of economic promotion and regional peace keeping. Asia Techno Farm Initiative introduced in this paper shows the actual program contents how the project should be implemented and operated under the collaboration & linkage between university, industry and government showing their roles to play. Program consists of four R&D areas, 1) Global Solution S&T (Food & Energy / Environment), 2) Smart Agriculture (2.1 Precision Agriculture, 2.2 Robotics & 2.3 Green Factory), 3) Special Education, 4) Social Service. One of the objectives is to grow FFA (Future Farmer of Asia) human resources. Further details of the program may be explained in details.

Keywords: Future Farmer of Asia, ASEAN Economic Community, Smart Agriculture, University - Industry Linkage.

1 Introduction

Asia Food Project is one of the proposals proposed by the author for AEC to show how it should be managed for promoting regional economy and stable peace keeping. Rice should be picked up as the main framework of AEC to encourage member countries to be easily united each other to compete and collaborate in the community.[1]

2 Asia Techno Farm

Asia Techno Farm is one of the coupled programs to materialize the Asia Food Project on actual farming for the purpose of promoting technology transfer & extension, FFA human resources development and achieving the final goal mentioned above as shown on right in Fig. 1.

Fig. 2 shows the program of Asia Techno Farm Initiative consisting of four areas, 1) Global Solution S&T (Food & Energy / Environment), 2) Smart Agriculture (2.1 Precision Agriculture, 2.2 Robotics and 2.3 Green Factory), 3) Special Education, 4) Social service.

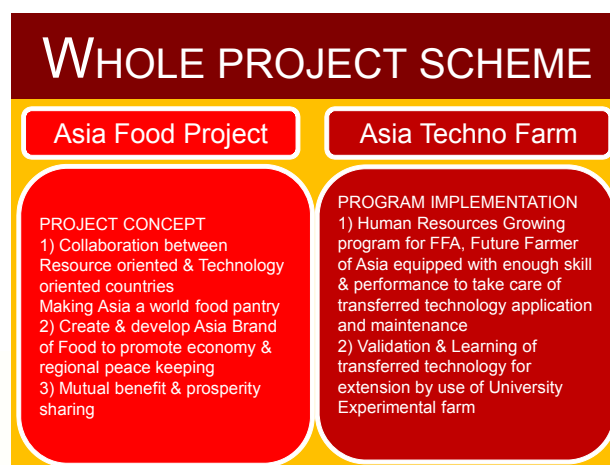


Fig. 1 Whole project scheme.

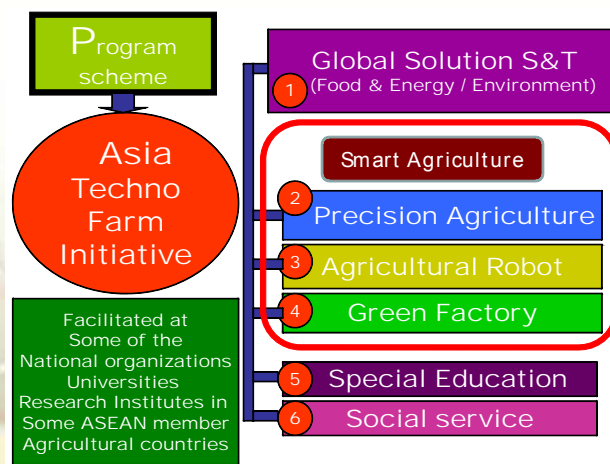


Fig. 2 Asia Techno Farm Initiative.

This program is focusing on the community development, not on the individual small scale farmer. The



farming population should be reduced toward the future and the reduced extra farming population should be absorbed by the other industry sector. Then the farm land released from the farmers can be collected for scale up of other farmers. Meaning of promotion of farm mechanization is to actively do "promote" with strong will, not naturally letting it be going relying totally on the individual farmer. The meaning of strengthening agriculture is to make it competitive. Requirements to be satisfied with 1) safe & high quality and 2) competitive price should be always kept in mind.

Looking at the current level of Asian farm mechanization it looks too early to consider the high tech machine introduction, however the author thinks how many years more we must force the small scale farmer to follow and engage with low income farming business. The answer may be found to rethink for what purpose AEC was established.

The farming population should be reduced for scale up of farming, and the program should be prepared and offered together for growing FFA, (Future Farmers of Asia), otherwise the technology can't be transferred. The higher level of program for training/education should be prepared and offered. Growing FFA is not only for future Thai farmers, but also for Asian farmers to ASEAN Economic Community.

3 Smart Agriculture

3.1 Precision Agriculture.

This is one of the environment friendly farming systems reducing losses and saving time, energy & materials, similar to TOYOTA car manufacturing system as JIT (Just In Time) or "KANBAN", something like to 1) apply what you need, 2) by as much as you need, and 3) when needed.

3.2 Agricultural Robot.

One of the obstacles to negotiate the robotization especially for mobile machine was product liability issue and cost down for farmers to buy. Some of the industries are now going to sell the commercial product equipped with high tech sensor & control system.

3.3 Green Factory.

Stable harvest and safty can be secured under optimally controlled environment by the software application of ICT and IoT. Currently this business is getting popular and

accepted by the consumer for the reason of chemical free inspite of comparatively expensive price.

4 Program Implementation

4.1 Budget proposal.

University should offer unique and original ideas for the collaborative joint education and R & D. Especially for the autonomous university, the facilities should be always managed efficiently and used effectively for promoting R & D and education, therefore even the farmland should be used for joint project with industry. This attitude makes the opportunity for the outside people to see directly what and how much university is doing activity aggressively.

4.2 FFA Growing Program.

Huge space area of university experimental farm should be provided for implementing the program operation. University should accept applicants for FFA, (Future Farmers of Asia) growing. Anybody can apply if they have strong will to become FFA to be qualified with full performance and skill of taking care of high tech machines and their maintenance & repair. The higher level of skills are needed to handle the data gathered by electronic signal. Demonstration sites should be prepared to demonstrate innovated technology for the people to know the precision agriculture by direct observation. Farm should be prepared for FFA to grow crops. Budget should cover all expenses related to program operation. Participants for FFA can be covered for purchasing materials and their labor fee. Progress must be reported regularly to get together spending one day including the site visit. Handout(s) or progress report should be submitted and distributed prior to the progress report presentation. All participants are strictly requested to follow the above mentioned way.

4.3 University - Industry Linkage.

Machines needed for the training program to grow crop experimentally. University requests industry to provide machines. The reason why she requests industry to do so is due to the difficulty of spare parts supply. In addition university should ask industry to send one technician for taking care of the machines. The spirit of this idea is to ask industry to collaborate together to promote the farm mechanization. University can provide farmland with free of charge. University asks industry to join and share a role



of program promotion. Participated industry should be recommended with first priority to FFA participants in future. People involved in the program should be equally happy to share the role and assignment. This is the spirit of this program

4.4 *Inter disciplinary Eductaion.*

Terminology like "Mechatronics" is newly made by the Japanese. Agricultural machineries are mostly at the same level as car industry. It should be strongly notified that inter disciplinary education is extremely requested for FFA to learn.

5 Conclusion

The expected effects are shown as conclusion.

- Asia can be a big food producing region as the world "Food Pantry" in production and supply on demand.
- Development of Asia food brand can promote the regional economy and stabilize the peace keeping.
- FFA, Future Farmers of Asia should be grown up for making agriculture competitive.
- Resource oriented ASEAN member countries and Technology oriented ones of ASEAN +3 should collaborate and compete each other for vitalizing Asian agriculture and sustainable development of regional economy.
- University can open the agricultural experimental station for FFA to experience the crop growing at least more than one season.
- University provides the facility and Industry provides machines, then government provides the budget for encouraging farmers to shift to a big scale farming.
- Most important requirement is to make the products competitive in the market. They must be high quality, safe and competitive price.
- High tech agriculture is needed to achieve the final goal of AEC by ASEAN & ASEAN +3 collaboration.
- Technology transfer & HRD like FFA program can be promoted for regional economy and peace keeping and stability.
- Younger generation can be exchanged by mobility program for higher education to be a center of excellence of FFA

■ Asia Techno Farm program can contribute a lot globally in showing the good example of training program model for resources development.

■ ATFI program surely encourages younger generation to be FFA.

■ Asia can be united tightly based on rice mechanization.

■ Thailand should be qualified as the leader of AEC in Asia.

■ If this program can be managed successfully, agriculture is no longer a low-income occupation.

6 Acknowledgements

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7 References

Nobutaka Ito (2014) Asia Agriculture Growth Strategy in Abenomics, presented as the Invited Speaker by Agricultural Mechanization Session, JSAMFE (Japanese Society of Agricultural Machinery and Food Engineers, Ryukyu University, Okinawa, Japan, May 17, 2014.